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John T. Pienkos, Reg. No. 42,997

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): David Charles Schwartz, *et al.*  
Serial No.: 10/688,416  
Filed: October 17, 2003  
For: Micro-Channel Long Molecule Manipulation System  
Docket No.: 960296.00129

INFORMATION DISCLOSURE STATEMENT

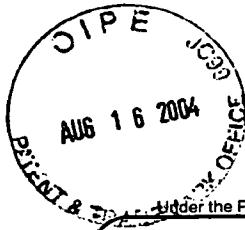
This paper is being presented for filing in the above case pursuant to Rules 97 and 98 of the Rules of Practice.

Four sets of Forms PTO/SB/08A "Information Disclosure Statement by Applicant" are attached. The first set of Forms PTO/SB/08A lists newly-cited references, and copies of the references are enclosed.

As for the remaining three sets of Forms PTO/SB/08A, these respectively list references that were cited during the prosecution of three patent applications of which the present Application claims the benefit, namely, U.S. patent application Nos. 09/962,802 (now U.S. Patent No. 6,610,256); 08/855,410 (now U.S. Patent No. 6,294,136); and 08/415,710 (now U.S. Patent No. 5,720,928). The Applicants respectfully submit that, pursuant to 37 CFR 1.98(d), no copies of the references listed on these Forms PTO/SB/08A need be submitted to the Patent Office.

No additional fees for filing this paper are believed to be due. However, the Commissioner is hereby authorized to charge any additional fees due or to credit any overpayment to deposit account no. 17-0055.

Respectfully submitted,  
DAVID CHARLES SCHWARTZ, *et al.*  
By:   
John T. Pienkos  
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**Substitute for form 1449/PTO**

## **INFORMATION DISCLOSURE STATEMENT BY APPLICANT**

**(Use as many sheets as necessary)**

Sheet 1 of 2

<b>Complete if Known</b>	
Application Number	10/688,416
Filing Date	October 17, 2003
First Named Inventor	David Charles Schwartz
Art Unit	
Examiner Name	
Attorney Docket Number	960296.00129

## U. S. PATENT DOCUMENTS

## FOREIGN PATENT DOCUMENTS

FOREIGN PATENT DOCUMENTS					
Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear
		Country Code <sup>3</sup> Number <sup>4</sup> Kind Code <sup>5</sup> (if known)			
/SKM/ 	WO 94/18218		08-18-1994	Seq. Ltd.	
	WO 00/09757		02-24-2000	U.S. Genomics	
	PCT Int'l Search Report				

Examiner Signature	/Stephanie Mummert/ (05/29/2007)	Date Considered	05/29/2007
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**\*EXAMINER:** Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.<sup>1</sup> Applicant's unique citation designation number (optional).<sup>2</sup> See Kinds of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04.<sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3).<sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document.<sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible.<sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.

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Substitute for form 1449/PTO <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> <i>(Use as many sheets as necessary)</i>				<b>Complete if Known</b>
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Sheet	2	of	2	<b>Attorney Docket Number</b> 960296.00129

<b>OTHER PRIOR ART-NON PATENT LITERATURE DOCUMENTS</b>			
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
/SKM/		Chih-Ming Ho, "Fluidics - The Link Between Micro and Nano Sciences and Technologies", Proceedings of the IEEE 14th Annual International Conference On Microelectro Mechanical Systems. MEMS 2001. Interlaken, Switzerland, Jan 21-25,	
/SKM/		2001, IEEE International Micro Electro Mechanical Systems Conference, New York, NY: IEEE, US, vol. CONF. 14, (01-21-2001), pgs 375-384, XP010534628 ISBN: 0-7803-5998-4, pg 378-379.	
/SKM/		Unger M A Et Al: "Monolithic Microfabricated Valves and Pumps by Multilayer Soft Lithography", Science, American Association For The Advancement Of Science, US, vol. 288, 04/07/2000, pgs. 113-116, XP002192277 ISSN: 0036-8075 Figure 1.	
/SKM/		Stix, Gary; "Thinking Big-A Harvard Medical School dropout aims to usher in the personal-genomics era," Innovations, Scientific American, June 2002, pgs. 30-31.	
/SKM/		Stikeman, Alexandra, "Nanobiootech Makes The Diagnosis," Technology Review, May 2002, pgs. 61-66.	

Examiner Signature	/Stephanie Mummert/ (05/29/2007)	Date Considered	05/29/2007
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Prior art cited in this U.S. Patent No. 6,610,256

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Sheet 1

of 7

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		Number-Kind Code <sup>2</sup> (if known)			
/SKM/		US- 4,473,452	Sep., 1984	Cantor et al.	
		US- 4,695,548	Sep., 1987	Cantor et al.	
		US- 4,737,251	Apr., 1988	Carle et al.	
		US- 4,767,700	Aug., 1988	Wallace	
		US- 4,870,004	Sep., 1989	Conroy et al.	
		US- 5,059,294	Oct., 1991	Lizardi	
		US- 5,079,169	Jan., 1992	Chu et al.	
		US- 5,314,829	May, 1994	Coles	
		US- 5,380,833	Jan., 1995	Urdea	
		US- 5,405,519	Apr., 1995	Schwartz	
		US- 5,599,664	Feb. 1997	Schwartz	
		US- 5,720,928	Feb., 1998	Schwaratz	422/186
		US- 5,985,549	Nov., 1999	Singer et al.	435/6
		US- 6,147,198	Nov., 2000	Schwartz	
		US- 6,150,089	Nov., 2000	Schwartz	
		US- 6,294,136	Sep., 2001	Schwartz	422/186
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		Country Code <sup>3</sup> "Number" "Kind Code <sup>4</sup> (if known)				
/SKM/		FR 2605472	Apr., 1988	Alain Bouillet		
		WO 84/02001	May, 1984	Trustees of Columbia Univers		
		WO 87/01955	Sep., 1987	Washington University		

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/Stephanie Mumment/ (05/29/2007)

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05/29/2007

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				First Named Inventor	David Charles Schwartz
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Sheet	2	of	7	Attorney Docket Number	960296.00129

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/SKM/		Allison et al., 1992, "Immobilization of DNA for Scanning Probe Microscopy", Proc. Natl. Acad. Sci. USA 89: 10129-10133.				
		Barlow and Lehrach, 1987, "Genetics by Gel Electrophoresis: The Impact of Pulsed Field Gel Electrophoresis on Mammalian Genetics", Trends on Genetics 3: 167-171.				
		Bendich and Smith, 1990, "Moving Pictures and Pulsed-Field Gel Electrophoresis Show Linear DNA Molecules Form Chloroplasts and Mitochondria" Current Genetics 17: 421-425.				
		Bensimon, et al., 1994, "Alignment and Sensitive Detection of DNA by a Moving Interface" Science 265: 2096-2098.				
		Burke et al., 1987, "Cloning of Large Segments of Exogenous DNA into Yeast by Means of Artificial Chromosome Vectors", Science 236: 806-812.				
		Bustamante et al., 1992, "Circular DNA Molecules Imaged in Air by Scanning Force Microscopy", Biochemistry 31: 22-26.				
		Campbell et al., 1991, "Generation of a Nested Series of Interstitial Deletions in Yeast Artificial Chromosomes Carrying Human DNA", Proc. Natl. Acad. Sci. USA 88: 5744-5748.				
		Carle et al., 1986, "Electrophoretic Separations of Large DNA Molecules by Periodic Inversion of the Electric Field", Science 232: 65-68.				
		Cavalli-Sforza, 1990, "Opinion: How Can One Study Individual Variation for 3 Billion Nucleotides of the Human Genome", Am. J. Hum. Genet. 46: 649-651.				
↓		Chattoraj et al., 1978, "DNA Coordination with Polyamines", J. Mol. Biol. 121: 327-337.				

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<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>			Application Number	10/668,416
(use as many sheets as necessary)			Filing Date	October 17, 2003
			First Named Inventor	David Charles Schwartz
			Group Art Unit	
			Examiner Name	
Sheet 3 of 7			Attorney Docket Number	960296.00129

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/SKM/		Chumakov et al., 1992, "Continuum of Overlapping Clones Spanning the Entire Human Chromosome 21q", Nature 359: 380-387.	
		Church and Gilbert, 1984, "Genomic Sequencing", Proc. Natl. Acad. Sci. USA 81: 1991-1995.	
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		Ferrin and Camerini-Otero, 1991, "Selective Cleavage of Human DNA: RecA-Assisted Restriction Endonuclease (RARE) Cleavage", Science 254: 1494-1497.	
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		Gosule and Schellman, 1978, "DNA Condensation with Polyamines I. Spectroscopic Studies", J. Mol. Biol. 121: 311-326.	
		Guo et al., 1993, "Sizing of Large DNA Molecules by Hook Formation in a Loose Matrix", J. Biomol. Struct. and Dynam. 11: 1-10.	
↓		Guo et al., 1992, "Sizing Single DNA Molecules", Nature 359: 783-784.	

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/SKM/		Gurrieri et al., 1990, "Imaging of Kinked Configurations of DNA Molecules Undergoing Orthogonal Field Alternating Gel Electrophoresis by Fluorescence Microscopy", Biochemistry 2: 3396-3401.
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/SKM/		Link and Olson, 1991, "Physical Map of the <i>Saccharomyces cerevisiae</i> Genome at 110-Kilobase Resolution", <i>Genetics</i> 127: 681-698.
↓		Lodish et al., 1995, <i>Molecular Cell Biology</i> , W.H. Freeman, NY, p. 345.
↓		Luckham and Klein, 1984, "Forces Between Mica Surfaces Bearing Adsorbed Polyelectrolyte, Poly-L-lysine, in Aqueous Media", <i>J. Chem. Soc. Faraday Trans. I</i> , 80: 865-878.
↓		Lyubchenko et al., 1992, "Atomic Force Microscopy Imaging of Double Stranded DNA and RNA", <i>J. Biomol. Struct. and Dynam.</i> 10: 589-606.
↓		Maier et al., 1992, "Complete Coverage of the <i>Schizosaccharomyces pombe</i> Genome in Yeast Artificial Chromosomes", <i>Nat. Genet.</i> 1: 273-277.
↓		Manuelidis et al., 1982, "High-Resolution Mapping of Satellite DNA Using Biotin-Labeled DNA Probes", <i>J. Cell. Biol.</i> 95: 619-625.
↓		Massa, 1973, "Flow Properties of High-Molecular-Weight DNA Solutions: Viscosity, Recoil, and Longest Retardation Time", <i>Biopolymers</i> 12:1071-1081.
↓		Matsumoto et al., 1981, "Light Microscopic Structure of DNA in Solution Studied by the 4',6-Diamidino-2-phenylindole Staining Method", <i>J. Mol. Biol.</i> 152:501-516.
↓		Murray and Szostak, 1983, "Construction of Artificial Chromosomes in Yeast", <i>Nature</i> 305:189-193.
↓		Ohi et al., 1978, "Mapping of Mitochondria 4S RNA Genes in <i>Xenopus laevis</i> by Electron Microscopy", <i>J. Mol. Biol.</i> 121:299-310.
↓		Perkins et al., 1994, "Direct Observation of Tube-like Motion of a Single Polymer Chain", <i>Science</i> 264:819-822.

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<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>			Application Number	10/688,416
(use as many sheets as necessary)			Filing Date	October 17, 2003
Sheet 6 of 7			First Named Inventor	David Charles Schwartz
			Group Art Unit	
			Examiner Name	
			Attorney Docket Number	960296.00129

<b>OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS</b>				
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.		T <sup>2</sup>
/SKM/		Poddar and Maniloff, 1986, "Chromosome Analysis by Two-Dimensional Fingerprinting", Gene 49:93-102.		
		Porath and Axen, 1976, "Immobilization of Enzymes to Agar, Agarose, and Sehadex Supports", Meth. Enzymol. 44:19-45		
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	↓	Zubay, 1988, Biochemistry (Macmillan Publishing Company, New York) pp. 918-919.		

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Prior Art Cited in U.S. Patent No. 6,294,136

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Application Number	10/688,416
Filing Date	October 17, 2003
First Named Inventor	David Charles Schwartz
Art Unit	
Examiner Name	
Attorney Docket Number	960296.00129

### U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number and Code <sup>2</sup> (if known)			
		US- 4,473,458	Sep., 1984	Cantor et al.	204/180
		US- 4,695,548	Sep., 1987	Cantor et al.	435/179
		US- 4,737,251	Apr., 1988	Carle et al.	204/182
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		US- 5,985,549	Nov., 1999	Singer et al.	435/6
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		Country Code <sup>3</sup> Number <sup>4</sup> Kind Code <sup>5</sup> (if known)				
		FR 2605472	Apr., 1988	Alain Bouillet		
		WO 84/02001	May, 1984	Trustees of Columbia Univers		
		WO 87/01955	Sep., 1987	Washington University		

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		Perkins et al., 1994, "Direct Observation of Tube-like Motion of a Single Polymer Chain", <i>Science</i> 264: 819-822.	

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<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> <i>(use as many sheets as necessary)</i>			Application Number	10/668,416
Sheet <b>7</b> of <b>8</b>			Filing Date	October 17, 2003
			First Named Inventor	David Charles Schwartz
			Group Art Unit	
			Examiner Name	
			Attorney Docket Number	960296.00129

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		Southern, 1975, "Detection of Specific Sequences among DNA Fragments Separated by Gel Electrophoresis", <i>J. Mol. Biol.</i> 98: 503-517.
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Sheet	8	of	8	Attorney Docket Number	960296.00129										

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Prior Art Cited in US. PATENT NO. 5,720,928

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Application Number	10/688,416
Filing Date	October 17, 2003
First Named Inventor	David Charles Schwartz
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### U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code <sup>2</sup> (if known)			
/SKM/		US- 4,473,452	Sep., 1984	Cantor et al.	
		US- 4,695,548	Sep., 1987	Cantor et al.	
		US- 4,737,251	Apr., 1988	Carle et al.	
		US- 4,767,700	Aug., 1988	Wallace	
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↓		US- 5,314,829	May, 1994	Coles	436/165
		US- 5,380,833	Jan., 1995	Urdea	
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/SKM/		FR 2605472	Apr., 1988	Alain Bouillet		
↓		WO 84/02001	May, 1984	Trustees of Columbia Univers		
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/SKM/		Chattoraj et al., "DNA Condensation with Polyamines", J. Mol. Biol. 121, (1978), pp.327-337.			
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/SKM/		Campbell et al., 1991, "Generation of a nested series of interstitial deletions in yeast artificial chromosomes carrying human DNA", Proc. Natl. Acad. Sci. USA 88:5744.	
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/SKM/	↓	Romling et al., 1989, "A physical genome map of <i>Pseudomonas aeruginosa</i> ", <i>EMBO J.</i> 8(13): 4081-4089.
↓	↓	Smith et al., 1989, "Observation of Individual DNA Molecules Undergoing Gel Electrophoresis", <i>Science</i> 242: 203.
↓	↓	Kucherlapati et al., 1988, <i>Genetic Recombination</i> pp. 92-106.
↓	↓	Zubay, 1988, <i>Biochemistry</i> (Macmillan Publishing Company, New York) pp. 918-919.
↓	↓	Woolf et al., 1988, "Mapping genomic organization by field inversion and two dimensional gel electrophoresis", <i>Nucleic Acids Research</i> 16(9): 3863.
↓	↓	Carle et al., Electrophoretic Separations of Large DNA Molecules by Periodic Inversion of the Electrif Field", <i>Science</i> 232: 65-68.
↓	↓	Poddar and Maniloff, 1986, "Chromosome analysis by two-dimensional fingerprinting", <i>Gene</i> 49: 93-102.
↓	↓	Stellwagen, N.C., 1985, "Orientation of DNA molecules in agarose gels by pulsed electric fields", <i>J. Biomol. Str. and Dyn.</i> 3(2): 299.
↓	↓	Yanagida et al., 1983, "Dynamic behaviors of DNA Molecules in solution..." <i>Cold Spring Harbor Symp. Quant. Biol.</i> 47: 177.
↓	↓	Dev. et al., 1982, "Techniques for chromosome analysis", <i>Techniques in Somatic Cell Genetics</i> , edited by Shay, pp. 493-503.
↓	↓	Manuelidis et al., 1992, "High-resolution mapping of satellite DNA using biotin-labeled DNA probes", <i>Biol. Abstr.</i> 76(4), Ref. No. 27153, p. 2940.

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<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>			Application Number	10/688,416
(use as many sheets as necessary)			Filing Date	October 17, 2003
			First Named Inventor	David Charles Schwartz
			Group Art Unit	
			Examiner Name	
			Attorney Docket Number	960296.00129
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/SKM		Chattoraj et al., 1978, "DNA Coordination with polyamines", J. Mol. Biol. 121: 327.	
		Ohi et al., 1978, "Mapping of Mitochondria 4S RNA genes in Xenopus laevis by electron microscopy", J. Mol. Biol. 121: 299.	
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		Smith and Bendich, 1990, "Electrophoretic charge density and persistence length of DNA as measured by fluorescence microscopy", Biopolymers 29(8-9): 1167.	
		Sturm and Weill, 1989, "Direct observation of DNA chain orientation and relaxation by electric birefringence: Implications for the mechanism of separation during pulsed-field gel electrophoresis", Physical Rev. Letters 62(13): 1484.	
		Stellwagen, 1988, "Effect of pulsed and reversing electric fields on the orientation of linear and supercoiled DNA molecules in Agarose Gels", Biochemistry 27: 6417.	
		Schwartz, et al., "Conformational Dynamics of Individual DNA Molecules During Gel Electrophoresis", Nature, Apr. 6, 1989, pp. 520-522.	
		Poddar et al., Chromosome analysis by two-dimensional fingerprinting", Gene, 49 (1986), pp. 93-102.	
		Woolf et al., "Mapping genomic organization by field inversion and two dimensional gel electrophoresis", Nucleic Acid Research, Vol. 16, No. 9 (1988), pp. 3863-3875.	
		Roemling et al., "A physical genome map of Pseudomonas aeruginosa", The EMBO Journal, Vol. 8, No. 13 (1989), pp. 4081-4089.	

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/SKM/		Yanagida et al., "Dynamic Behaviors of DNA Molecules in Solution...", Cold Sprg. Hrbr. Symp. Quant. Biol. 47, pp. 177-187, 1983.
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		Kucherlapati et al., Genetic Recombination, 1988, pp. 92-106.
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		Carle et al., "Electrophoretic Separations of Large DNA molecules...", Science, Apr. 4, 1986, pp. 65-68.
		Dev. et al., "Techniques for Chromosome Analysis", Techniques in Somatic Cell Genetics, edited by Shay, 1982, pp. 493-503.
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		Manuelidis et al., Biol. Abstr. 76(4), Ref. No. 27153, P. 2940. 1992
		Gerlach et al. (1984) Cytometry 5:562-571.
↓		K. R. Khrapko et al., "A Method For DNA Sequencing By Hybridization With Oligonucleotide Matrix", J. DNA Sequencing and Mapping, 1991, vol. 1, pp. 375-388.

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/SKM/		R. C.Williams, "Use Of POlylysine For Adsorption Of Nucleic Acids and Enzymes To Electron Microscope Specimen Films", Proc. Natl. Acad. Sci. USA, vol. 74, No. 6, pp. 2311-2315, Jun. 1977.	
/SKM/		F. Fish et al., "A sensitive Solid Phase Microradioimmunoassay For Anti-Dougle Stranded DNA Antibodies", Arthritis and Rheumatism, vol. 24, No. 3 (Mar. 1981).	

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